

Food-Grade Grain Crops on Farms in the Northeastern U.S.

Elizabeth Dyck

Organic Growers' Research & Information-
Sharing Network

OGRIN

- Focus on organically grown grains with potentially high value
- Overview of grain crops under cultivation:
Advantages/challenges of growing/marketing these crops

Modern wheat varieties

In NY/PA, certain varieties have established reputations as making high-quality, great tasting bread/baked goods

- Warthog (modern HRWW): “best in show” at tasting held at International Culinary School in NYC
- Fredrick (modern SWWW)



Modern wheat varieties

- Demand for locally and regionally grown wheat much higher than supply
- No varieties are resistant to *Fusarium graminearum* (head blight, scab)
- Spring wheat (high quality): difficult to get sustainable yields if growing for the wholesale milling market
 - Planting date
 - Poor stand establishment
 - Weed pressure
- Winter wheat: lower protein, requires flexibility from bakers

Heritage Wheat Varieties



Winter grown Red Fife

Heritage wheat varieties

- Market cachet: Command higher retail price than modern varieties
- Evidence that these wheats can have higher mineral content than modern varieties
- Speculation that these wheats may be easier to digest
- Require less fertility
- Excellent straw yield
- Increased risk of lodging
- May have yield drag

White Frost Farm (Central PA) 2010 Hard Red Winter Wheat Trial

Variety	Yield (bu/A)	Tillers per ft ²	Tiller height (in)	Protein (%)	Falling Number (seconds)	Vomitoxin (ppm)
AC Morley	41a	56a	37a	10.7c	305c	0.0
Warthog	43a	58a	32a	11.8b	385a	0.0
Red Fife	31a	62a	40a	13.1a	342b	0.0

Testweight and Yield of Selected SWW, Three Sites,
2012-2013

Variety	Testweight (lb/bu)	Yield (bu/A)
Fulcaster	59.0	42.3
Gold Coin	57.8	40.8
Pride of Genesee	60.7	40.5
Genesee Giant	58.6	43.1
Honor	57.4	42.1
Fredrick (modern)	58.4	43.7

Full results at <http://plbrgen.cals.cornell.edu/research-extension/small-grains/cultivar-testing>

**Whole Grain Protein Content of Heritage and Modern Winter
Wheat Varieties, Freeville, NY, 2013**

Variety	Class	Protein*
Fulcaster	SRW (heritage)	10.5
Gold Coin	SWW (heritage)	11.5
Pride of Genesee	SWW (heritage)	12.1
Genesee Giant	SWW (heritage)	11.6
Honor	SWW (heritage)	11.5
Fredrick	SWW (modern)	9.7
Warthog	HRW (modern)	9.4
*At 12% moisture		

Heritage wheat varieties

- Market cachet
 - Speculation that these wheats may be easier to digest
 - Evidence that these wheats can have higher mineral content than modern varieties
 - Command higher retail price than modern varieties
 - Require less fertility
 - Excellent straw yield
 - Increased risk of lodging
 - May have yield drag
- **Seed difficult to source and can be expensive**

Rye

- Good market
 - In demand for flour and distilling
- Excellent weed suppression
- Challenges:
 - Diseases can destroy value of crop
 - Fusarium*, Ergot
 - Low reported yields
 - Very few varieties available—mostly cover crop varieties

Oats

- Excellent for the rotation (good break crop for dicots and other grasses)
- Consumer demand high and unmet for locally grown oat products
- Need to dehull or grow hull-less variety
- Conventional method for rolled oats complex, designed for large-scale processing—has scared growers/microprocessors away

Barley

- Market for malting barley
- Varieties not bred for NE growing conditions (sprouting in the head)
- Like wheat and rye, prone to *Fusarium*
- Difficult to source varieties

Ancient Wheats



Spelt
(*Triticum
aestivum* ssp.
Spelta)



emmer
(*Triticum
turgidum*
ssp.
Dicoccon)



einkorn
(*Triticum
monococcum*)

Spelt

Market increasing

- nutritional benefits
 - tasty
 - anecdotal evidence of better tolerance by gluten-sensitive consumers (NOT by those with celiac disease)
- Most available varieties proprietary
 - Several vigorous winter varieties; good spring varieties lacking
 - Needs to be dehulled
 - Contracting with custom dehullers/marketers only worthwhile at larger acreages
 - On-farm dehulling, milling, selling to restaurants, consumers, potentially lucrative (retail prices)

Emmer

- Market increasing due to
 - unique flavor
 - nutritional benefits
- Spring and winter varieties grow well in the NE
- Spring emmer seed commercially available; winter varieties being increased
- Tolerant of stressful growing conditions; weed suppressive compared to spring wheat
- Later harvest date than wheat—can be a very good thing
- Can be used in baking, as pasta, or as whole grain
- Yield drag compared to wheat
- Needs to be dehulled



Spring emmer crop,
White Frost Farm, PA

Einkorn

- Strong demand
 - flavor
 - nutritional properties
 - some evidence that is easier for those with gluten problems to digest (NOT by those with celiac disease)
- Multiple uses: leavened bread, baked goods, pasta, whole grain (cooks rapidly)
- Winter varieties appear to be more viable than spring (stouter straw, higher yield)
- Later harvest date than wheat
- Seed not yet commercially available—need to bulk your own
- Needs to be dehulled

Buckwheat

- Indispensable crop for a sustainable rotation
 - Break crop extraordinaire
 - Refugia for beneficials
 - Weed suppressor extraordinaire

Buckwheat suppressing thistle



Buckwheat

- Indeterminate growth habit can make it tricky to harvest
- So-so market for flour
- Groats potentially high value/high demand
- Difficult to dehull (we're working on it)

Specialty corn

- Organic yellow corn
- Heritage cultivars
- Purple, red, multicolored cultivars
- Multiple products: Cornmeal, polenta, grits, roasted corn versions
- In some markets, greater demand for corn than small grain products
- Corn is a host of *Fusarium*
- Too much corn in our cropping systems



- Opportunities to diversify with food-grade grains
- Important not to overload the rotation with
 - hosts of *Fusarium*
 - winter grain crops
- Before growing, consider marketing options and whether the market requires processing of the grain